UNIT8-DAY6-LaB1230

Monday, April 29, 2013
9:01 PM

Thinking Like a Chemist
About Electrochemistry
→ Wrap Day ←

UNIT8 DAY6

CH302 Vanden Bout/LaBrake Spring 2013

IMPORTANT INFORMATION

UNIT8 EXAM WEDNESDAY 7:00 PM – 9:00 PM

Wel 1.316 #1-150
Wel 2.112 151+

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POLL: Clicker Question 1

Over the semester, I figured out how to effectively learn the material for this class.

A) NOT True of me at all
B) Somewhat NOT True of me
C) Somewhat true of me
D) Very True of Me

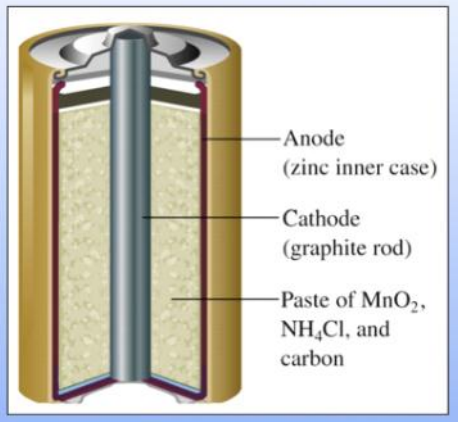
What are we going to learn today?

READINESS ASSESSMENT QUIZ

Applications of REDOX Chemistry
Chemical Energy ←→ Electrical Energy

Batteries without liquids

Dry Cell



$Zn(s) \rightarrow Zn^{2+}(aq) + 2\ e^-$

$2MnO_2(s) + 2\ H^+(aq) + 2\ e^- \rightarrow Mn_2O_3(s) + H_2O$

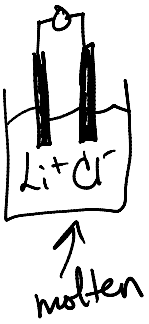
The Key
Solid Electrolyte
Paste
NH_4^+, NH_3, H_2O

Carbon makes electrical connection

Very slow reaction. Constant V. Very low current

Get started on the RAQ.

Periodic Clicker Questions
Bonus Points to those who write answers on board.



POLL: Clicker Question 2

RAQ#2: The reaction occurring at the cathode is:

a) $2\ Cl^- \rightarrow Cl_2 + 2e^-$
b) $Cl_2 + 2e^- \rightarrow 2Cl^-$
c) $Li^+ + 1e^- \rightarrow Li$
d) $Li \rightarrow Li^+ + 1e^-$

POLL: Clicker Question 3

$2Li^+ + 2Cl^- \rightarrow Cl_2 + 2Li$ $n=2$ $2e^-$

$2Li : 2e^-$ 1:1 ratio

RAQ#3: The time it will take to produce 100 g of Li is:

$Li^+ + 1e^- \rightarrow Li$ $(1e^-)$

1:1 ratio

a) 32 days
b) 16 days
c) 8 days
d) .08 days

$F = 96,485\ C/mole^-$

POLL: Clicker Question 4

RAQ#5: The standard cell potential is:

a) -4.26
b) 1.84 V
c) 3.05 V
d) 4.26 V

a) -4.26
b) 1.84 V
c) 3.05 V
d) 4.26 V

POLL: Clicker Question 6

$E^0 = 4.26V$

RAQ#6: The non-standard cell potential is:

What is the Redox Rxn?

a) 3.88 V
b) 3.92 V
c) 4.12 V
d) 4.22 V

$$Q = \frac{[Li^+]^2[Mn^{2+}]}{[H^+]^4}$$

POLL: Clicker Question 7

RAQ#7: The free energy under standard conditions:

a) - 421 J/mol rxn
b) - 421 kJ/mol rxn
c) - 822 kJ/mol rxn
d) - 822 J/mol rxn

Fuel Cell

POLL: Clicker Question 8

$\Delta G = -nFE^0$ per mole Rxn

PARTII RAQ#4: How much electrical work from fuel cell:

a) 475 kJ/mol rxn
b) 118 kJ/mol rxn
c) 92 kJ/mol rxn
d) 17 J/mol rxn

ΔG (not 1 kg)

1.18×10^5 kJ for 1 kg

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POLL: Clicker Question 9

PARTII RAQ#5: Determine value of K for this reaction:

a) infinitely small
b) 1
c) ridiculously large

$\Delta G = -474$ kJ

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What did we learn today?

That is very important to fill out the online course survey form. It' like voting, it is your civic duty.
The instructors of this course hope that you will do well on Unit 8 Exam.